

§ 34.60

Subpart G—Test Procedures for Engine Exhaust Gaseous Emissions (Aircraft and Aircraft Gas Turbine Engines)

§ 34.60 Introduction.

(a) Except as provided under § 34.5, the procedures described in this subpart shall constitute the test program used to determine the conformity of new aircraft gas turbine engines with the applicable standards set forth in this part.

(b) The test consists of operating the engine at prescribed power settings on an engine dynamometer (for engines producing primarily shaft power) or thrust measuring test stand (for engines producing primarily thrust). The exhaust gases generated during engine operation must be sampled continuously for specific component analysis through the analytical train.

(c) The exhaust emission test is designed to measure concentrations of hydrocarbons, carbon monoxide, carbon dioxide, and oxides of nitrogen, and to determine mass emissions through calculations during a simulated aircraft landing-takeoff cycle (LTO). The LTO cycle is based on time in mode data during high activity periods at major airports. The test for propulsion engines consists of at least the following four modes of engine operation: taxi/idle, takeoff, climbout, and approach. The mass emission for the modes are combined to yield the reported values.

(d) When an engine is tested for exhaust emissions on an engine dynamometer or test stand, the complete engine (with all accessories which might reasonably be expected to influence emissions to the atmosphere installed and functioning), shall be used if not otherwise prohibited by § 34.62(a)(2). Use of service air bleed and shaft power extraction to power auxiliary, gearbox-mounted components required to drive aircraft systems is not permitted.

(e) Other gaseous emissions measurement systems may be used if shown to yield equivalent results and if approved

14 CFR Ch. I (1–1–01 Edition)

in advance by the Administrator or the Administrator of the EPA.

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§ 34.61 Turbine fuel specifications.

For exhaust emission testing, fuel that meets the specifications listed in this section shall be used. Additives used for the purpose of smoke suppression (such as organometallic compounds) shall not be present.

SPECIFICATION FOR FUEL TO BE USED IN AIRCRAFT TURBINE ENGINE EMISSION TESTING

| Property | Allowable range of values |
|--|---------------------------|
| Density at 15°C | 780–820. |
| Distillation Temperature, °C 10% Boiling Point | 155–201. |
| Final Boiling Point | 235–285. |
| Net Heat of Combustion, MJ/Kg | 42.86–43.50. |
| Aromatics, Volume % | 15–23. |
| Naphthalenes, Volume % | 1.0–3.5. |
| Smoke point, mm | 20–28. |
| Hydrogen, Mass % | 13.4–14.1. |
| Sulfur Mass % | Less than 0.3%. |
| Kinematic viscosity at—20° C, mm ² /sec. | 2.5–6.5. |

[Doc. No. FAA–1999–5018, 64 FR 5559, Feb. 3, 1999]

§ 34.62 Test procedure (propulsion engines).

(a)(1) The engine shall be tested in each of the following engine operating modes which simulate aircraft operation to determine its mass emission rates. The actual power setting, when corrected to standard day conditions, should correspond to the following percentages of rated output. Analytical correction for variations from reference day conditions and minor variations in actual power setting should be specified and/or approved by the Administrator:

| Mode | Class | | |
|-----------------|-------|------------|-----|
| | TP | TF, T3, T8 | TSS |
| Taxi/idle | (*) | (*) | (*) |
| Takeoff | 100 | 100 | 100 |
| Climbout | 90 | 85 | 65 |
| Descent | NA | NA | 15 |
| Approach | 30 | 30 | 34 |

*See paragraph (a) of this section.

(2) The taxi/idle operating modes shall be carried out at a power setting